

## Latrobe TNW,ç ASTM M10 High Speed Steel

Category : Metal , Ferrous Metal , Alloy Steel , Carbon Steel , High Carbon Steel , Tool Steel

### Material Notes:

TNW is an M10 type high speed steel with a composition that combines the high toughness of a high-molybdenum steel and the excellent wear resistance provided by the 2% vanadium content. TNW is popular for twist drills, reamers, taps, router bits, end mills and similar cutting tools. Its good toughness makes it well suited for punches and other cold work tools that require high hardness and wear resistance. Information Provided by Timken Latrobe Steel. Timken sold Latrobe in December 2006. They are now Latrobe Specialty Steels Co.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Latrobe-TNW-ASTM-M10-High-Speed-Steel.php](http://www.lookpolymers.com/polymer_Latrobe-TNW-ASTM-M10-High-Speed-Steel.php)

Physical Properties	Metric	English	Comments
Specific Gravity	7.89 g/cc	7.89 g/cc	
Density	7.89 g/cc	0.285 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell C	40.0	40.0	Oil Quenched from 1218Â°C; 566Â°C Double Temper Temperature
	@Temperature 650 Â°C	@Temperature 1200 Â°F	
	60.5	60.5	
	@Temperature 316 Â°C	@Temperature 601 Â°F	Oil Quenched from 1218Â°C; 566Â°C Double Temper Temperature
	65.0	65.0	Oil Quenched from 1218Â°C; 566Â°C Double Temper Temperature
	@Temperature 22.0 Â°C	@Temperature 71.6 Â°F	
Modulus of Elasticity	207 GPa	30000 ksi	
Machinability	50 - 55 %	50 - 55 %	1% Carbon Steel
Izod Impact Unnotched	47.5 J	35.0 ft-lb	Oil Quenched at 1218Â°C; 482Â°C Temper Temperature
	58.3 J	43.0 ft-lb	Oil Quenched at 1218Â°C; 566Â°C Temper Temperature
	59.7 J	44.0 ft-lb	Oil Quenched at 1218Â°C; 622Â°C Temper Temperature
	73.2 J	54.0 ft-lb	Oil Quenched at 1163Â°C; 482Â°C
	88.1 J	65.0 ft-lb	Oil Quenched at 1163Â°C; 622Â°C
	107 J	79.0 ft-lb	Oil Quenched at 1163Â°C; 594Â°C

Thermal Properties	Metric	English	Comments
CTE, linear	10.79 $\mu\text{m/m-}^{\circ}\text{C}$	5.994 $\mu\text{in/in-}^{\circ}\text{F}$	
	@Temperature 38.0 - 260 $^{\circ}\text{C}$	@Temperature 100 - 500 $^{\circ}\text{F}$	
	12.58 $\mu\text{m/m-}^{\circ}\text{C}$	6.989 $\mu\text{in/in-}^{\circ}\text{F}$	
	@Temperature 38.0 - 649 $^{\circ}\text{C}$	@Temperature 100 - 1200 $^{\circ}\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.87 %	0.87 %	
Chromium, Cr	4.0 %	4.0 %	
Iron, Fe	84.63 %	84.63 %	
Manganese, Mn	0.30 %	0.30 %	
Molybdenum, Mo	8.0 %	8.0 %	
Silicon, Si	0.30 %	0.30 %	
Vanadium, V	1.9 %	1.9 %	

Chemical Properties	Metric	English	Comments
Critical Temperature	774 $^{\circ}\text{C}$	1430 $^{\circ}\text{F}$	Ar3
	804 $^{\circ}\text{C}$	1480 $^{\circ}\text{F}$	Ar1
	830 $^{\circ}\text{C}$	1530 $^{\circ}\text{F}$	Ac1
	857 $^{\circ}\text{C}$	1570 $^{\circ}\text{F}$	Ac3

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